SUPERIOR COURT OF NEW JERSEY
BERGEN COUNTY
HON. CHARLES J. WALSH, J.S.C.
DOCKET NO.: BER-L-7718-03MT

IN RE DIET DRUG LITIGATION

MOTIONS TO DISMISS FOR LACK OF ELIGIBILITY

MOVANT: WYETH, INC.

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OPPONENTS: JANE ARMSTRONG (BER-L-7024-03MT); LINDA BOWLES (BER-L-5649-03MT); MARY FROST (BER-L-6014-03MT); ELAINE HILL (BER-L-2564-04MT); MONICA HUFFAKER (BER-L-6024-03MT); MARCIA LARMAN (BER-L-6012-03MT); ALLISON LEAVY (BER-L-6417-03MT) ERNESTINE PERRY (BER-L-5981-03MT); ELEANOR SMITH (BER-L-6025-03MT); PATRICIA STANFORD (BER-L-6013-03MT)

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HEARINGS CONDUCTED: JUNE 21, 2004 – JUNE 25, 2004

LETTER OPINION: JULY 22, 2004

This matter is before the Court on applications by Wyeth Corporation, as the successor to American Home Products Corporation ("AHP") and each of its former subsidiaries, affiliates and divisions (collectively "Wyeth or defendants") challenging the eligibility of ten (10) plaintiffs to exercise intermediate ("IOO") or back-end opt-outs ("BEOO") of the Nationwide Class Action Settlement ("CAS"). These plaintiffs are: Jane Armstrong ("Armstrong"); Linda Bowles ("Bowles"); Mary Frost ("Frost"); Elaine Hill ("Hill"); Monica Huffaker ("Huffaker"); Marcia Larman ("Larman"); Allison Leavy ("Leavy"); Ernestine Perry ("Perry"); Eleanor Smith ("Smith"); and Patricia Stanford ("Stanford").

The Court conducted an evidentiary hearing which began on June 21, 2004 and continued for five (5) days. During that period, the Court heard testimony from: Martin E. Goldman, M.D. ("Dr. Goldman"); Charles Gibbs Vasey, M.D. (Dr. Vasey"); Bruce Charash, M.D. ("Dr. Charash"); Muhamed Saric, M.D. PhD ("Dr. Saric"); Mark V. Sherrid, M.D. ("Dr. Sherrid"); Arthur Millman, M.D. ("Dr. Millman"), all of whom were cardiologists; and Frank Miele ("Miele"), an engineer and physicist. The Court also reviewed the testimony of Stephen E. Weinberg, M.D. ("Dr. Weinberg") and Robert J. Hilkert, M.D. ("Dr. Hilkert"), both cardiologists, taken by videotape and was present at the videotaped deposition of Richard Weiss, M.D. ("Dr. Weiss"), a cardiologist. The bulk of the direct testimony of each of these witnesses was presented through affidavits, certifications or reports which were adopted during the course of the evidentiary hearing. In addition, the Court considered the contents of several treatises which were recognized in the proceedings as reliable under **N.J.R. Evid.** 803 (c)(18),

including: Harvey Feigenbaum, **ECHOCARDIOGRAPHY** (5th Ed. 1994) ("Feigenbaum"); Arthur Weyman, **PRINCIPLES AND PRACTICES OF ECHOCARDIOLOGRAPHY** (2nd Ed. 1994) ("Weyman Text"); Novin C. Nanda, **ATLAS OF COLOR DOPPLER ECHOCARDIOGRAPHY** (1989); and J.P. Singh, et al., *Prevalence and Clinical Determinants of Mitral, Tricuspid, and Aortic Regurgitation (The Framingham Heart Study)*, 83 *Am. J. Cardiology* (1999) ("Singh").

The Court previously discussed the standards to be used in assessing these eligibility challenges. *In Re: Diet Drug Litigation*, BER-L-7718-03 (Law Division April 13, 2004) ("*Eligibility Standards Opinion*" (slip op at 31-36). Each plaintiff seeking to exercise an IOO or BEOO was required by the CAS to establish that he or she was FDA Positive by a qualifying echocardiogram. FDA Positive, as defined, contains two standards. First, the quantitative measurements that constitute FDA Positive heart valve regurgitation are as follows:

> Aortic Valve – Mild or greater regurgitation, defined as regurgitant jet diameter in the parasternal long-axis view (or in the apical long-axis view, if the parasternal long-axis view is unavailable), equal to or greater than ten percent (10%) of the outflow tract diameter (JH/LVOT).
>
> Mitral Valve – Moderate or greater regurgitation, defined as regurgitant jet area in any apical view equal to or greater than twenty percent (20%) of the left atrial area (RJA/LAA).

CAS § I.22.b

The CAS also requires that specific criteria be used in determining whether these levels of valvular regurgitation are present. Singh at 897-98.

Second, the CAS requires the echocardiograms be performed and evaluated by "qualified medical personnel" in accordance with the methodology set forth in two (2) referenced texts – The Feigenbaum Text and the Weyman Text. *Eligibility Standards Opinion* (slip op at 12-16).

This Court already has determined that "Wyeth [may] disqualify an IOO or BEOO if it establishes that the performance and/or evaluation of the

echocardiogram (at issue) was medically unreasonable as a matter of law. Stated another way, Wyeth [may] . . . disqualify . . . [an] IOO or BEOO if it can show that . . . [an] expert's conclusions respecting the echocardiogram supporting the opt-out could not 'reliably flow from the facts known to the expert and the methodology used.'" *Eligibility Standards Opinion* (slip op at 31) (citations omitted).

For the reasons which follow, the Court finds that Wyeth has satisfied the Court that the echocardiograms supporting claims of Armstrong, Frost, Hill, Larman, Smith and Stanford have not been performed and/or interpreted in a medically reasonable manner. Accordingly, the Complaints filed by these plaintiffs are dismissed and those plaintiffs returned to the Class. The Court, however, finds that Wyeth has failed to support its eligibility challenges as to Bowles, Huffaker, Leavy and Perry. Accordingly, Wyeth's motions to dismiss will be denied as to them. The findings of fact and conclusions of law supporting these determinations are reported below.

I

A.

In order to determine whether Wyeth's challenges have merit, one has to understand the underlying medical conditions claimed by these plaintiffs and the tools used to detect and treat those conditions. Mild aortic and moderate mitral regurgitation are the two (2) medical conditions that permit either an IOO or BEOO. These conditions involve the backward or reverse flow of blood through defective valves during the heart's pumping cycle.

The heart consists of four chambers: the right atrium, the right ventricle, the left atrium and the left ventricle. The right atrium receives deoxygenated blood from the body and ejects that blood into the right ventricle though the tricuspid valve; the right ventricle then pumps that blood across the lungs through the pulmonic or pulmonary valve for oxygenation. The oxygenated blood, in turn, is received by the left atrium, which ejects blood into the left ventricle through the mitral valve. The left ventricle then pumps that oxygenated blood into the aorta through the aortic valve, and from there to the rest of the body. The heart chambers are connected by valves that open to allow blood to pass through and then close to prevent significant backflow. This process ensures the proper directional flow of blood through the heart.

The chambers of the heart fill and empty in a two-phase cardiac cycle that comprises diastole - - the filling cycle, and systole - - the emptying cycle. For our purposes, we are concerned with the active contraction of the left ventricle and pumping of blood into the aorta through the open aortic valve during systole. Throughout this phase the mitral valve is closed to prevent backward flow or regurgitation from the left ventricle into the left atrium. We are also interested in the other phase of the cardiac cycle -- diastole – which occurs when blood enters the left ventricle through the open mitral valve. During this phase the aortic valve is closed to prevent leakage or regurgitation from the aorta back into the left ventricle.

Healthy heart valves rarely prevent all regurgitation. When these valves are closed there may be a minimal amount of leakage -- trace regurgitation. Moreover, during routine valve closure, blood caught between the valve leaflets is displaced backward resulting in some blood backflow. This backward displacement of blood is considered part of the closing process, and is not regurgitation. According to Weyman "true" mitral regurgitation "should last throughout most or all of systole." Weyman Text at 429. A brief or non-sustained jet of mitral regurgitation is an indication that the regurgitation is usually less than mild. The same source teaches that "true" aortic regurgitation should continue "throughout diastole." *Id*. at 529. Aortic regurgitation that is brief or non-sustained is usually less than mild.

Normally blood flows at a uniform velocity in a forward direction. This normal blood flow is laminar. Regurgitant flow, on the other hand, produces a jet of mixed velocities which is turbulent. It is this turbulent flow which is one of the focuses of echocardiography.

According to Singh, the degree of valvular regurgitation or valvular insufficiency is classified as trace, mild, moderate, or severe. Trace aortic regurgitation and trace and mild mitral regurgitation are common in the general population and are considered normal findings. Singh at 900.

B.

Echocardiography is a principal technique used to evaluate the heart, including its function, structure and the flow of blood through it. The underlying principle involved in echocardiography is the use of high frequency sound waves. A transducer is placed on the patient's chest wall which emits sound waves that bounce off of the heart's structures, and that information is translated into moving

images of those structures on a screen. There are several different techniques available in echocardiography. The technique relevant here is Doppler echocardiography. "Doppler echocardiography is based on the change in frequency of a sound wave that occurs when it strikes a moving target – in this case the red blood cells." Weyman Text at 143.

Color flow Doppler is used to display the movement of blood flow through the heart by assigning different colors depending upon the direction and velocity of the blood flow. By convention, laminar blood flowing towards the transducer is depicted in shades of red, and laminar blood flowing away from the transducer is depicted in shades of blue; darker shades indicating slower velocity and lighter shades higher velocity. *See* Feigenbaum Text at 33. Turbulent blood flow is depicted in a "mosaic," multi-colored pattern, thus displaying the different velocities and directions of the blood in the area under study. The absence of blood flow is depicted by black on color flow Doppler. Thus, in Doppler echocardiography blood flow is represented as discrete color areas (jets) in real time, superimposed on two-dimensional images of the heart's structure.

The quality of an echocardiogram depends on a number of factors including: the patient's body; the technical skill of the physician or sonographer performing the study; the equipment used and its settings; and, physician interpretation and measurements. The proper performance of an echocardiogram in the cases before this Court must follow the guidelines set forth in the Weyman and Feigenbaum Texts.

Settings on the echocardiographic equipment can have a substantial impact on the quality of the images and the accuracy of the recordings. Two (2) key settings on the equipment are referred to as the Nyquist limit and gain setting. The Nyquist limit establishes the maximum velocity of laminar blood flow that can be detected in a monochromatic fashion (solid color).[1] When the velocity of the turbulent blood flow exceeds the pre-set Nyquist limit the color depicting the blood flow "wraps around" so that if the flow is laminar it appears to be flowing in the opposite direction. The blood flow in such circumstances may also appear as a "mosaic," multi-colored pattern. If the Nyquist limit is set too low, the velocity of normal blood flow may exceed a low Nyquist setting and will appear as turbulent

[1] As the Feigenbaum Text at 29 notes: "The major disadvantages of pulsed Doppler is that the velocity one can measure is limited. The pulsed system inherently has a pulsed repetition frequency or PRF. The PRF determines how high a Doppler frequency the pulse system can detect. …. The inability of a pulsed Doppler system to detect high –frequency Doppler shifts is known as "aliasing." The upper limit of frequency that can be detected with a given pulsed system is known as the "Nyquist" limit or number. This limit is defined as one half the pulse repetition frequency or PRF. *See* Miele Certification at ¶¶ 16, 17, 31 and 32.

regurgitation, even though it is actually normal non-regurgitant flow. Additionally, when the Nyquist limit is set too low it will exaggerate the degree of any regurgitation present by including normal blood flow velocity in the turbulent regurgitant jet area. Virtually all the experts who testified here agree that a higher Nyquist limit generally leads to a more reliable echocardiogram. A recent consensus report by the American Society of Echocardiography stressed the importance of an appropriate Nyquist limit.

> Numerous technical, physiologic and anatomic factors affect the size of the regurgitant area and therefore alter its accuracy as an index of regurgitation severity. Jet size is affected by instrument factors, especially pulse repetition frequency (PRF) and color gain. Standard technique is to use a Nyquist limit (aliasing velocity) of 50/60 cm/sec, and a color gain that just eliminates random color speckle from non-moving regions. Jet area is inversely proportional to PRF, and *substantial error can be introduced with use of higher or lower settings* than the nominal settings to which echocardiographers have become accustomed.

The Task Force on Valvular Regurgitation Recommendation for Evaluation of the Severity of Native Valvular Regurgitation with Two-dimensional and Doppler Echocardiography, J. Am. Soc. Echocardiography, 16: 777, 778 (2003) (emphasis added).

A color Doppler gain setting is another important variable in the echocardiographic system. If the gain on echocardiographic equipment is set too high, the image has "a background noise" or "speckling," seriously degrading the quality of the echocardiogram and making it difficult to assess true regurgitation. As Weyman teaches, the "detection of the Doppler frequency shift is critically dependent on the signal/noise ratio, and every effort must be made to maximize this relationship." Weyman Text at 256.

Another important technical aspect of echocardiographic acquisition relates to the angle the transducer is placed relative to the heart when images are recorded. If those images are not acquired in the appropriate angle or plane, the amount of regurgitation and the sizes of the chambers of the heart may appear larger or smaller than they really are. Again, Weyman teaches that "doppler frequency shifts are maximal when the sound beam is parallel to the flow vector (i.e., aligned

parallel to the path of blood flow in the vessel of interest) … The Doppler beam, therefore, is ideally aligned parallel, rather than perpendicular, to flow because larger frequency shifts are easier to detect and the output is less subject to random fluctuation." Weyman Text at 256.

FDA Positive heart valve regurgitation involving the aortic valve requires that two (2) measurements be made: (1) the height of the jet of aortic regurgitation ("JH"); and (2) the height of the left ventricular outflow tract ("LVOTH" or "LVOT").[2] The JH measurement is the linear width of the jet of aortic regurgitation as it leaks backward into the left ventricle. Feigenbaum tells us that this measurement must be made as close as possible to the point of origin of that jet on the ventricular side of the aortic valve. Feigenbaum Text at 283. Otherwise, the measurement will be exaggerated by the spray or "nozzle effect" that occurs when high velocity liquid (regurgitant blood) is ejected through a narrow orifice into a lower pressure chamber (the left ventricle in diastole). *Id.* at 283. The LVOT is the region of the left ventricle below the aortic valve. These two measurements are then expressed as a ratio JH/LVOT. Current technology utilizes digitally calibrated calipers or cursors, which can measure the linear width of the

[2] The same diagram illustrating how this measurement is actually made is displayed in the Feigenbaum Text at 285, Fig. 6-101 and the Weyman Text at 534. The illustration as it appears in Weyman is reproduced below.

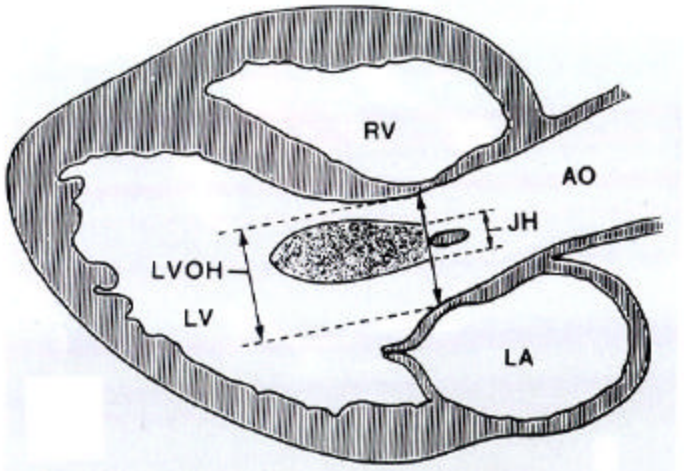

Fig. 19–61. The measurement of regurgitant jet height. Regurgitant jet height (JH) is measured at the aortic valve level in the parasternal long axis view. AO = aorta; LA = left atrium; LV = left ventricle; LVOH = left ventricular outflow tract height; RV = right ventricle. (From Perry GJ, et al.: Evaluation of aortic insufficiency by Doppler color flow mapping. J Am Coll Cardiol 9:952, 1987. Reprinted with permission from the American College of Cardiology.

JH and LVOT on a frozen frame or image using a digitally calibrated caliper or cursors, from commercially available software packages.

The definition of FDA Positive mitral regurgitation also requires two (2) measurements to be made: (1) the regurgitant jet area, or "RJA"; and (2) the left atrial area, or "LAA." Unlike the linear width measurements made of the JH and LVOT, the RJA and LAA are area measurements. Again these measurements are expressed as a ratio, RJA/LAA, in assessing the degree of mitral regurgitation. These measurements of the RJA and LAA can be done while the sonographer is acquiring the study, or off-line, and are referred to as tracings or planimetry when using the technology just described.

II

A.

The Court considered the qualifications of the experts as is required by **N.J.R. EVID.** 702. *Kemp ex rel Wright v. State*, 174 N.J. 412, 427 (2002). Overall, the Court found the experts called by Wyeth and the plaintiffs to be well qualified in the areas offered.

The Court found Drs. Goldman and Vasey particularly well qualified in the field of echocardiography. Dr. Goldman is a Professor of Medicine at the Mt. Sinai School of Medicine in New York and has taught at that medical school for over twenty (20) years. Dr. Goldman has written extensively in the field of echocardiology and holds positions as a director of the American Society of Echocardiography, one of the bodies seeking to promote advances in the field of echocardiography, as well as several of its committees. Dr. Vasey, too, is well credentialed in the field of echocardiography also serving on the board of the American Society of Echocardiography as well as its operating committees. Both witnesses impressed the Court with their knowledge and candor. Copies of their curriculum vitae are part of the hearing record.

The plaintiffs, too, produced witnesses with excellent qualifications. Dr. Charash is a senior attending physician at Lenox Hill Hospital and Chief of the Cardiac Care Unit at that facility. Although he does not claim special expertise in the field of echocardiography, he is knowledgeable about its use in clinical medicine and has extensive experience with echocardiographic techniques used in the diagnosis and treatment of patients. Dr. Weiss is also well credentialed. He is presently a Clinical Associate Professor of Medicine at the University of

Pennsylvania and has held that position since 1997. In addition, he also serves as the Director of Echocardiography at Presbyterian Hospital Center in Philadelphia, Pennsylvania and has held that position since 1997. Dr. Hilkert, too, is a qualified expert in the field of echocardiography. Dr. Hilkert is active in the American Society of Echocardiology and is a Level 3 Cardiologist. He is now the Director of Mid-Atlantic Cardiovascular Medicine and Research Specialists at Pfizer Pharmaceutical Group. Dr. Weinberg rounds out the cardiologists called as witnesses by the plaintiffs. He is a physician practicing cardiology at Cardiovascular Associates of the Delaware Valley and has over twenty-five (25) years of clinical experience.[3] The curriculum vitae of these experts are included as part of the record.

The expert cardiologists appointed by the Court under the terms of the *Eligibility Standards Opinion* also are well qualified. Dr. Saric is presently the Director of the Echocardiography Laboratory at the University of Medicine and Dentistry of New Jersey. In addition to his M.D. degree, and board certifications in cardiology and echocardiography, Dr. Saric holds a PhD in medical sciences from New York University. Dr. Sherrid is presently the Director of the Echocardiography Laboratory at St. Luke's Roosevelt Hospital Center and serves as an Associate Professor of Clinical Medicine at the Columbia University College of Physicians and Surgeons. Dr. Sherrid recently has served as the Vice President of the New York Echocardiography Society. Dr. Millman is the Chief of Cardiology at Trinitas Hospital in Elizabeth, New Jersey. He has had extensive experience in echocardiography and teaches cardiology fellows from the Seton Hall Graduate School of Medical Education. The curriculum vitae of these experts also are part of the record.

B.

The Court's decisions in these individual eligibility cases largely are based on the quality of the echocardiograms. Plaintiffs' experts attempt to excuse the general poor quality of these echocardiograms by claiming that the echocardiograms were sufficient from a legal perspective to support an FDA Positive diagnosis. This attitude is typified by Dr. Charash:

[3] Mr. Miele provided general information about the laws of physics governing echocardiography and the equipment used in its practice. As noted later in this Letter Opinion, the Court found Mr. Miele quite knowledgeable in these areas. Mr. Miele's resume is part of the record.

> Q: You've absolutely told us that in the legal standard you can reach conclusions that you would not reach in your clinical practice with respect to these patients.
>
> * * * *
>
> A: For the purposes of litigation you have to come up at times with what the best estimate of their future is, but in clinical practice you have the advantage of tracking that specific future.
>
> The difference between litigation and real medicine is in real medicine you track a patient and follow their specific outcome and deal with complications. In litigation you're coming up to what's the best solution for a person's future and where it will go, so there are clearly differences of litigation versus clinical medicine.
>
> In litigation I would not use a qualifying echo if I didn't think the quality was at the level I wanted. In litigation if that's all you're allowed to do and as an expert making an opinion of what's more likely than not, then you do the best you can with the information you have, and we're talking about in all litigation, predicting the probability of an outcome. In medicine you actually track the real outcome.
>
> So there are differences between me, Dr. Charash, treating physician, and me, Dr. Charash, expert in predicting what will be an outcome and what we can make of information. So those differences are the defining differences. Not that I'm thinking that the criteria of these trials are arbitrary and nonsense, I'm just saying that the perspective of a clinician is different than that of a medical legal expert.

Dr. Charash's views about the law plainly have colored his opinions and, in this Court's view, have made his operating methodology suspect. The same is true to a lesser extent for the other experts called by plaintiffs. *Kemp*, 174 N.J. at 434, as well as *Dauber v. Merrill Dow Pharmaceuticals., Inc.*, 509 U.S. 579 (1993) and

its progeny which interpret the similar **FED. R. EVID.** 702, demand that medical and other scientific evidence be reliable. In a real sense, the law requires that a physician function in the courtroom as he or she would in an operating suite or in clinical practice. It is the reliability of the methodology viewed in this context which permits the admissibility of the opinions.

The initial reports of physicians with respect to virtually all these challenged echocardiograms significantly overstated the pathology observed. And each of the plaintiffs' experts spent much of his time seeking to explain these overstatements. In many instances, the techniques used in performing the echocardiograms fell so far below appropriate practice so as to make the data reported in the echocardiograms virtually worthless in either diagnosis or treatment.

Plaintiffs were aware that the qualifying echocardiograms in issue would be used to support the opt-outs sought. One would have thought that each would have been conducted with scientific rigor. But it seems the reverse is true. As will be seen, in six (6) out of the ten (10) cases here, the submitted echocardiograms were of such poor quality that they could not as a matter of law support those plaintiffs' claims to qualify as FDA Positive.

The findings with respect to the ten (10) plaintiffs follow in the next section of this Letter Opinion. Where credibility determinations were made, they are reflected in the findings reported below.

III

A. Jane Armstrong

Armstrong relies on a December 6, 2002 echocardiogram performed by Cardiovascular Associates of Delaware Valley and a report of Dr. Gregg L. Fortino. Dr. Fortino found that Armstrong had moderate mitral regurgitation ("MMR") using the CAS criteria -- RJA/LAA.[4]

The December 6, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman Dr. Sherrid, and Dr. Weinberg. Both Dr. Goldman and Dr. Sherrid found that the claimed MMR was

[4] As already noted, RJA means regurgitant jet area and LAA means left atrium area. Dr. Fortino's worksheet reports RJA/LAA in four (4) frames, only one of which is MMR. The four (4) measurements indicate the ratio to be: 5.5%; 14.3%; 19.2%; and 29.7%. Only the last measurement reported on Armstrong's worksheet is above 20% -- the cut-off for MMR.

not medically reasonable. Both cardiologists found that the observed phenomenon which was alleged to be a jet was present "for only a brief moment during the cardiac cycle recorded" or, stated another way, only "a small puff . . . of mitral regurgitation occurred…." Relying on both the Feigenbaum and Weyman Texts, both physicians found that Armstrong's alleged jet seen on the December 6, 2002 echocardiogram was not indicative of mitral regurgitation because it was not holosystolic. The Weyman Text, at 428-429, specifically notes:

> Mitral regurgitation characteristically produces a high velocity, turbulent, systolic flow disturbance (jet) in the left atrium, which can be detected by pulsed . . ., continuous wave, or color flow Doppler. The high peak velocity of the jet (i.e., 5 to 6 m/sec) is due to the large pressure difference between the left ventricle and left atrium during systole. . . . Jet turbulence produces a wide range of velocities, which broadens the frequency spectrum of the Doppler signal. *Mitral regurgitant flow typically begins immediately after mitral closure and continues throughout most or all of systole.* (Emphasis added.)

Weyman observes that regurgitation is not holosystolic where it occurs as a result of mitral valve prolapse. In this event, it is seen in the last part of the cycle. A reasonable conclusion from reading Weyman in context is that absent mitral valve prolapse regurgitation which is not holosystolic is a rare phenomenon. Weyman Text at 429.

The December 6, 2002 Armstrong echocardiogram clearly indicates that the mitral regurgitation there is transient and not holosystolic. Dr. Weinberg concedes this but fails to explain why the observed phenomenon is nevertheless the type of regurgitation contemplated in the CAS. Instead, Dr. Weinberg argues that the observed phenomenon is not backflow as suggested by Dr. Goldman because "the velocity is too high. Secondly, its too far back in the atrium. Thirdly, this jet is very well-circumscribed. Backflow would be more of . . . an amorphous flow pattern." But nowhere in his Certification or testimony does Dr. Weinberg explain how this transient phenomenon can fairly be characterized as MMR. The Court finds his conclusion that Armstrong has MMR to be medically unreasonable because it fails to account for the absence of a regurgitant jet for most of systole.

In making these findings, the Court also notes that in Paragraph 14 of his Certification Dr. Weinberg states that Armstrong's echocardiogram has several frozen frames which indicate that RJA/LAA exceeds 20%. But it turns out that Dr. Weinberg has included frozen frames taken from Armstrong's March and September 2003 echocardiogram and reported those findings as if they were part of the December 2002 echocardiogram.[5] Accordingly, the Court rejects the testimony

[5] The transcript of Dr. Weinberg's June 24, 2004 testimony reveals this:

> Q. So this echo that was generated back in December of 2002 was not read by you until April of this year, right?
> A. That's true -- yes. Appears that way.
> Q. Okay. Now, you're aware that sometime earlier this year, there was a challenge that was filed by Wyeth in these proceedings to certain people, including Miss Armstrong, correct?
> A. I -- I think so. I'm not sure what you're referring to.
> Q. Well, you filed an affidavit or certification, didn't you --
> A. Right.
> Q. -- with respect to Miss Armstrong and Miss Bowles?
> A. Yes.
> Q. And that was done, I think, in May, correct?
> A. I don't know.
>
> * * * *
>
> Q. And you filed . . . [the Certification] to refute what you thought were errors in Dr. Goldman's opinions in that regard, correct?
> A. That's correct.
> Q. And you made certain calculations down here at the bottom, in Paragraph 14, right?
> A. That's right.
> Q. And in Paragraph 15, you characterize the regurgitation that you saw as being, quote, very substantial, right?
> A. Well, greater than 20 percent.
> Q. And then you attached some frames that you planimetered that you based your opinions on, didn't you, Doctor?
> A. That's right.
> Q. And I'd refer you to Pages 15.13 through 15.21 that are attached there. Do you see those?
> A. Yes.
> Q. And are those the ones that you based your opinions on in your certification?
> A. Yes.
> Q. *Now, Doctor, were you aware that those frames were from the echo that was done in September of 2003 and March of 2003 on Miss Armstrong?*
> A. *I don't know that I looked at the dates, per se. Actually, these -- no. There are indeed two sets of echos here, that's true.*
> Q. *And they're from 2003, not 2002, are they, Doctor?*
> A. *That's correct.*
> Q. *And so they don't even deal with the same subject matter that Dr. Goldman's affidavit did, do they?*
> A. *I don't know which one he was referring to, so I --*
> Q. *Well, in your report, your April report --*
> A. *Right.*
> Q. *-- refers to the December 2002 echo, does it not?*
> A. *The --*
> Q. *Refer back to your Exhibit 6, if you'd like.*

reflected in Paragraph 14 of Dr. Weinberg's Certification as medically unreasonable.

In conclusion, while one (1) measurement of Armstrong's December 6, 2002 echocardiogram supports, though just barely, a conclusion that the phenomenon present on the tape, if regarded as RJA, is greater than 20% of the LAA, the Court finds that Wyeth has established that it is not medically reasonable to conclude that the phenomenon was MMR as defined in the CAS.

B. Linda Bowles

Bowles relies on a December 4, 2002 echocardiogram performed by Cardiovascular Associates of Delaware Valley and a report of Dr. Dominic M. Padulla. Dr. Padulla found that Bowles had severe mitral regurgitation (47%) using the CAS criteria -- RJA/LAA.

A. *Okay. This here, yes, this is from 2002.*
Q. *December 2002?*
A. *Correct.*
Q. *And so that is the echo that you were discussing or purporting to discuss in this affidavit, correct? Because you were refuting what Dr. Goldman had said about the December 6th, 2002?*
A. *I guess so. Yes, that could be. I was -- okay.*
Q. *But your opinions in this are based on the 2003 echos?*
A. *Correct, that's true.*
Q. Okay. So your comments in the affidavit are not relevant at all to the December 6th, 2002 echo, are they, Doctor?
A. They refer to the ones that I have done the pictures on, which would be 2003 echos.
Q. And you called it a very substantial amount of regurgitation?
A. Well, I said it exceeded 20 percent.
Q. Well, I think in your affidavit, didn't you call it -- look at Paragraph 15 of your affidavit.
A. Very substantial, yes.
Q. Very substantial amount of regurgitation. And this is the same echo that was read by the lady's treating physician as mild or mild to moderate, isn't that correct, Doctor?
A. Well, he read it as mild to moderate, that's true.
Q. He read it as mild in March, correct?
A. Well, he read it as one to two plus, which could be mild to moderate and he read it here as mild to moderate. But he also read it under the mitral valve as no significant mitral regurgitation. So which is it?
Q. No significant mitral regurgitation, is that what he said in his report?
A. That's what he says here and then he says mild to moderate.
Q. Okay. And in his earlier report, he called it mild, didn't he?
A. Well, he called it one to two plus.
Q. And then he called it mild, didn't he, Doctor? I don't mean to quibble with you.
A. No, he called it mild above and he called -- and it was one to two plus below.
Q. And you can't say that Dr. Rellas' interpretation of those echos was medically unreasonable, can you, Doctor?
A. Well, based upon what I found, and now that I see that the dates are -- I assume these are the dates, 3/6 and 9/9, I guess I would have to disagree that what I found was more than just mild. (Emphasis added.)

The December 4, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Vasey, Dr. Weinberg, and Dr. Millman. Both Dr. Weinberg and Millman found Bowles to have MMR. Dr. Vasey, however, concluded that the planimetered areas exceeded the "true mitral regurgitation jet on four (4) separate measurements, and improperly included non-abiased, or low-velocity, flow in the tracings." Thus, the tracings were overstated in his view. Of particular debate was the question of whether a large blue colored portion of the planimetered jet was regurgitation or entrained blood. Dr. Vasey ultimately concluded that while Bowles had some mitral regurgitation it was mild.

While there plainly is a dispute over the extent of Bowles' mitral regurgitation, the Court believes that this dispute is a medically reasonable one. As Dr. Vasey candidly testified:

> Q. So is it your testimony within a reasonable degree of medical certainty that if you included this little blue area down here, light blue area running along the right side here and let's call this little yellow greenish blue spur over here, if you included all of that, it's your testimony within a reasonable degree of medical certainty that comes to less than 20 percent?
>
> A. I would estimate that it would make a couple of percent difference and it should still be less than 20 percent.
>
> Q. And you can tell that by eyeballing it, is that right Doctor?
>
> A. That's an estimate.
>
> JUDGE WALSH: Well, I'm sure if he's wrong, that we'll see some planimetry that says it's 20 percent.
>
> A. As you know, also we also look at mitral regurgitation in the context of the other views, as suggested by all of the other medical texts we've considered here, and the other views, as I recall, the re-planimetered areas were 10 percent and 10 percent, and were quite consistent.

> JUDGE WALSH: Doctor, would you say this one is a close call? I mean –
>
> A. Yes.
>
> JUDGE WALSH: Could a reasonable physician, following proper methodology as you've expressed it, find it in excess of 20 percent mitral regurgitation?
>
> A. It's a close call. I would certainly agree with that.

In conclusion, Wyeth has failed to satisfy this Court that Dr. Weinberg's conclusion that Bowles had MMR was medically unreasonable.

C. Mary Frost

Frost relies on a June 5, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report of Dr. Muhammad Salim. Dr. Salim found that Frost had severe aortic regurgitation using the CAS criteria -- JH/LVOT>50. The worksheet and report notes that the echocardiogram was "technically difficult."

The June 5, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Sherrid and Dr. Charash. Both Dr. Goldman and Sherrid concluded that the echocardiogram had been performed in a medically unreasonable manner. Both noted that the Nyquist limit of 46 cm/sec was set "too low" and, according to Dr. Goldman, this echocardiogram is "unreliable to interpret." Finally, Dr. Goldman concluded that the phenomenon, even if credited as an aortic regurgitant jet, is "at most, trace."

Dr. Charash found that Frost had moderate to severe aortic regurgitation but conceded "that a pediatric sized transducer was used, which is not common for adults." He also conceded "there is always some potential biasing and aliasing from a low Nyquist level." Dr. Charash knew of no explanation of why a pediatric transducer was used "unless of course there was no adult transducer around." Dr. Charash excuses these serious technical faults and claims that the higher frequencies used in the transducer here would tend to underestimate the pathology while the Nyquist limits here would have the opposite effect -- hopefully, canceling out each other.

The Court finds that Wyeth has established that Frost's echocardiogram was not preformed in a medically reasonable manner and any data obtained from it is unreliable and cannot be meaningfully interpreted.[6]

D. Elaine Hill

Hill relies on a September 4, 2002 echocardiogram performed and read by Dr. Floyd W. Burke. Dr. Burke found Hill had MMR and mild aortic regurgitation using the CAS criteria -- JHA/LAA and JH/LVOT. The report noted a "poor acoustic window." Hill has withdrawn her claim of MMR and is relying solely on her claim of mild aortic regurgitation ("MAR").

The September 4, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Saric and Dr. Weiss. Dr. Saric stated that the "color Doppler imaging was not performed in a manner that I would consider standard echocardiographic practice." Dr. Goldman was unable to discuss the frame selected to show aortic regurgitation since "[t]he full diastolic cycle from which the frame was taken does not appear to be available. . ." Nevertheless, he indicated that the phenomenon on the frame appeared to be "laminar flow which is not regurgitation."[7]

Dr. Weiss found the "the aortic regurgitation on Hill's September 2002 echocardiogram was visualized but not planimetered in the parasternal long-axis view ("PSLA"). The PSLA view was technically limited and it is not possible to fully evaluate the jet in this view." Dr. Weiss claims that the aortic regurgitation is "well seen" in the apical view and he concurs with Dr. Burke.

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[6] The Court also credits Dr. Goldman's observation that two (2) physicians could not have a medically reasonable disagreement where one interprets an echocardiogram as indicating severe aortic regurgitation and another reports trace aortic regurgitation.

> THE COURT: Let me ask you a question, doctor. Is it medically reasonable for two physicians using appropriate technology and methodology to arrive, one, at a severe aortic insufficiency and another physician to arrive at tract insufficiency? In other words, it could be explained by interphysician variability and in reading.
> A. Absolutely not.
> THE COURT: In other words, in order to determine correct methodology, if such physicians existed, I would have to determine which if I physician to believe.
> A. Yes, sir.

[7] While Dr. Goldman indicated that Hill's echocardiogram was adequate from a technical standpoint, he found no aortic regurgitation, observing any phenomenon observed on the echocardiogram while in the parasternal long-axis view ("PSLA") not to be holodiastolic. He also confirmed that the so-called apical five (5) chamber view was not a reliable view for assessing the JH/LVOT ratio. As will be seen, the Court finds it to be an impermissible view under the CAS.

But the apical view which is referred to by Dr. Weiss is the so-called five (5) chamber view. The CAS is specific as to the permissible views when evaluated aortic regurgitation. The CAS requires that the view and qualifying measurements must be made "in the parasternal long-axis view (or in the apical long-axis view, if the parasternal long-axis view is unavailable)." That is not the case here. Accordingly, the Court finds that the echocardiogram fails to satisfy the technical minimums required by the CAS.[8]

[8] Testimony during Dr. Weiss' deposition suggests that the JH/LTOV measurement could successfully be made in the PSLA.

> Q. And although the parasternal view is not optimal, could the regurgitation be seen and measured in the parasternal view?
> A. Yeah.
> Q. And did you use then the apical views as confirmatory for the measurement that had been made in the -- of the regurgitation that had been seen in the parasternal long?
> A. That's correct.
> Q. Okay. Doctor, based upon the measurement that was made of the regurgitant jet in the parasternal long axis, what was the percentage of regurgitation?
> A. I would estimate that it's over 10 percent, causing it to be mild aortic regurgitation.

But Dr. Weiss contradicts their testimony at another point in his deposition:

> Q. Doctor, you're not saying the parasternal long is not available to view here, are you?
> A. What I'm saying is that the 2-D imaging is reasonable in this view, but the Doppler imaging is not that good quality.
> Q. Right. But measurements were made from the parasternal long, correct?
> A. That's correct.
> Q. And so you're using these additional views (apical views) as confirmatory for the measurements that were made in the parasternal long?
> A. Yeah, confirmatory, and I think the apical views are better and show a better look at that regurgitation.
> Q. Okay. Now did you -- you mentioned earlier that the parasternal long was not the optimal view for Ms. Hill's case?
> A. That's correct.
> Q. Okay. And did you make some of -- or what are the reasons why the parasternal long sometimes is not an optimal view?
> A. *To put it into very simple terms, it's not a pretty picture. We just can't see the cardiac structures well-defined. There are different components to a doppler echo study. One component is the 2-D imaging. One component is the color doppler. And in her, the 2-D imaging is marginal, the color doppler isn't optimally seen.*
> Q. Okay. Now, are there other views that you could look at to determine whether she had regurgitation? The size of the parasternal long?
> A. In her, the next sequence of pictures was the apical views. (Emphasis added.)

The Court accepts Dr. Weiss' testimony that the PSLA is available but lacks the diagnostic quality necessary to support a medically reasonable conclusion that Hill has at least MAR.

E. Monica Huffaker

Huffaker relies on a May 7, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report of Dr. Muhammad Salim. Dr. Salim found that Huffaker had severe aortic regurgitation and MMR using the CAS criteria -- JH/LVOT; RJA/LAA. Huffaker has subsequently withdrawn her claim that she has MMR and relies solely on the finding of FDA Positive aortic regurgitation.

The May 7, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Saric and Dr. Charash. Both Dr. Goldman and Saric found the JH/LVOT measurements stating aortic regurgitation were improperly done. Weyman plainly agrees with them:

> *The size of the regurgitant orifice can be approximated from the cross-sectional area and/or height of the regurgitant jet as its origin just below the aortic valve, and this "orifice size" has been used as a measure of the severity of regurgitation* (Fig. 19-61) [which shows the proper measurement technique.] . . . To ensure that the jet is imaged at its origin, measurements should be made only in areas where valve components are also recorded. Weyman Text at 534 (emphasis added).

Dr. Charash does not disagree that the jet was improperly measured because it was not measured at its origin and also correctly faults the inappropriate transducer angle visible on some of the frames used in the planimetary.[9] However,

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[9] Q. Why don't you describe what we're seeing on the screen, doctor.
A. We're seeing a high velocity jet entering the left ventricle from the aortic valve.
MR. D'ANGELO: Stop. Go back.
A. The jet is clearly high velocity. It's extending from the valve into the outflow track and past the point measurement.

If you take the widest point which is reasonably defined by that kind of long central section, I believe it clearly is more than 10 percent. You can see a lighter blue area alongside of it and that certainly would be legitimate not to measure.

You could go to the area of most intensity, but even if you limit this measurement, and again, there are some subjective differences from observer, but again, I feel that by eyeball this is unquestionably more than 10 percent of the aortic valve, the left ventricular outflow tracking, therefore, it meets the FDA criteria.

I don't think there's any way to reasonably call this a jet under 10 percent.

Dr. Charash nevertheless believes that the JH/LVOT ratio shown on the echocardiogram is greater than 10%.

Were the Court to be the ultimate fact-finder here, it would conclude that Huffaker does not qualify as having MAR. The echocardiogram plainly shows that the JH/LVOT ration was improperly measured thereby inflating the ratio. Moreover, no competent cardiologist could find severe aortic regurgitation based on the record here. However, bearing in mind the standards set in the *Eligibility Standards Opinion*, the Court finds that Wyeth has not met its burden of demonstrating that a finding of MAR is medically unreasonable. Dr. Saric best summarized the Court's view of this evidence. After eyeballing the aortic jet, and after measuring the JA at the annulus of the aortic valve, Dr. Saric indicated that "[t]he true JH at the aortic orifice size (sic) is probably no more than 1/7 of the measured .94 cm." If that value is divided by the *apparently undersized* LVOT of 1.7 cm the ratio is .076 (7.6%). Dr. Saric conceded that his measurement was an

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MR. D'ANGELO: Why don't we advance it just a little bit. There's a second measurement that's being used there. Another two seconds. Stop.

BY MR. D'ANGELO:
Q. If you could comment on that measurement, doctor, that's at 1231.53.
A. Yes. I mean clearly the resolution of this picture, the ability to see the outflow track and even the aortic valve annulus is not as well-defined as the previous one. The angle of the jets is a little bit off. You can see that this moment was captured clearly showing probably a transition in the transducer.

The angle has changed just a bit, but even so the main purpose of this frame is to just validate that there is a high intensity diastolic jet that clearly reflects aortic regurgitation. And even with the uncertainties of angulation here, that is too substantial to be considered trace aortic regurgitation.

So again, this picture I believe just reinforces the opinion that this jet is more than mild.

It would not be a frame I'd want to quantitate too much more beyond that, but it is certainly consistent with the previous picture, it's not just as well angulated as the previous.

THE COURT: Well, you took the words out of my mouth. You'd never use this to make a diagnosis or even a judgment as to whether someone was FDA positive.
THE WITNESS: No. Only, sir to the degree --
THE COURT: The transducer angle plainly is not positioned for ideal visualization.
THE WITNESS: Absolutely, Your Honor, and the only reason why I mention it is that if this was the only image I saw, it would be very difficult to understand its context, but as a companion to the other shot, it validates that there's aortic regurge.

Off-angled pictures may not serve the purpose of independent measurement but it can reinforce that what you saw was not a mirage. I man when you see something more than once, there is a legitimacy even if the second time is not as well framed.

I believe that as a companion to the other picture, this demonstrates the aortic regurgitation is real.

approximation. Considering Dr. Charash's testimony to the contrary and giving Huffaker the benefit of the doubt, the Court cannot find that a conclusion that she squeezes into the CAS definition of MAR, though just barely, is medically unreasonable.

F. Monica Larman

Larman relies on a June 7, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report of Dr. Jeffrey Crook. Dr. Crook found that Larman had severe aortic regurgitation using the CAS criteria -- JH/LVOT.

The June 7, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Saric and Dr. Charash. Both Dr. Goldman and Saric found that the echocardiogram was performed in a medically unreasonably way. Like Frost, Larman's echocardiogram was imaged using a pediatric transducer at a Nyquist limit of 46 cm/sec.[10]

Dr. Charash, as already noted, faults the technique and equipment used to conduct this echocardiogram but nevertheless believes that Larman has at least moderate aortic regurgitation.

For the reasons articulated by Dr. Goldman and Saric and for the reasons already discussed with respect to the Frost echocardiogram, the Court finds that Wyeth has shown the performance of Larman's echocardiogram to be medically unreasonable and the data generated in it to be unreliable.

G. Allison Leavy

Leavy relies on a June 14, 2002 echocardiogram performed on her and a report by Dr. James Colasacco. Dr. Colasacco found that Leavy had severe mitral regurgitation (RJA/LAA of 42%) and MAR using the CAS criteria -- JH/LVOT

[10] In a lucid and comprehensive Affidavit, Miele, an engineer with training in mathematics and physics, discussed the relationship of transmit frequencies, penetration and Nyquist restricted velocity. ¶¶ 30-38. He noted that the Nyquist limit must yield to considerations of the depth of the probe and the pulse repetition period ("PRP"). He further explained in his testimony that most echocardiographic equipment automatically adjusts the Nyquist limit. But review of the evidence shows that the Nyquist limit remained at 46 cm/sec in Larman's case even when the probe was relatively shallow (i.e. 14 cm). Dr. Goldman specifically testified that the Nyquist limit did not change when the probe depth was relatively shallow. This suggests to the Court that the Nyquist limit was deliberately set too low to satisfy reasonable medical practice and to overinflate the significance of any phenomenon observed.

and RJA/LAA. Leavy has withdrawn her claim of MAR and is relying solely on a reduced claim of MMR.

The June 14, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Saric and Dr. Hilkert. Both Dr. Goldman and Saric fault the high gain settings and the low Nyquist limit of 51 cm/sec. Both conclude that technically speaking the echocardiogram is of marginal quality, with Dr. Saric noting that "this study fails to meet commonly accepted echocardiography standards."

Dr. Hilkert, on the other hand, found Leavy's echocardiogram to be "technically adequate" though he apparently recognizes the study was hardly ideal -- "[d]espite any technical limitations of this echocardiogram." He concluded that the Leavy echocardiogram documented MMR finding that the frame attached to his Affidavit "had an RJA/LAA of 5.43/20.45 (26% and was a 'textbook' mitral regurgitation jet." The Court agrees that this freeze frame supports Dr. Hilkert's conclusion.

The Court carefully reviewed Dr. Hilkert's videotaped deposition. While Wyeth raised significant issues with respect to the technical quality of this study and raised concerns whether Dr. Hilkert's opinion was properly based on data appearing in "any apical view" as required by the CAS,[11] the Court finds Wyeth

[11] Dr. Hilkert wrote his Affidavit after reviewing several still frames and loops. He did not have the full file of the echocardiogram until after his Affidavit was prepared. The still frame he relied upon for his opinion that the echocardiogram documented MMR was not on the loops he had in his possession. Thus, he did not have an opportunity to review the loop from which the still frame was taken until shortly before his deposition. The Court considered this in assessing the reliability of his opinion. The testimony documenting this is set forth below.

> Q. A freeze-frame image is methodologically appropriate for you?
> A. If there's other information on the study that confirms that, yes.
> Q. Just so I understand, you submitted an affidavit in this case; correct?
> A. Correct.
> Q. And you attached three freeze-frame images; correct?
> A. That's correct.
> Q. And you specifically relied on the third one; correct? That was what you said? It was very well visualized; right?
> A. That's correct.
> Q. And that was a frame that I think you testified to Mr. Sugarman occurred in early systole?
> A. That still frame, correct.
> Q. You had no way of determining whether that image stopped before mid systole or continued because the loop wasn't on the DICOM tape; correct?
> A. From that particular still frame, right. That's correct.
> Q. And that was a still frame that you said in your affidavit was particularly well visualized; correct?
> A. That was one example of the regurgitation particularly well visualized.

failed to carry its burden of demonstrating that Dr. Hilkert's opinion is medically unreasonable.

H. Ernestine Perry

Perry relies on a June 19, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report of Dr. Gary Badzinski. Dr. Badzinski found Perry had severe aortic regurgitation using the CAS criteria -- JH/JVOT.

The June 19, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Millman and Dr. Charash. Dr. Charash found that Perry's aortic regurgitation was at least mild but more likely moderate: "I would not call this (Perry's aortic jet) 50 percent but I would certainly call this close to it. I would say it's closer more to a third than under 25 percent." Dr. Millman found that Perry has MAR observing that Perry's study was technically adequate and "demonstrates an aortic regurgitation fraction of > 10% but < 25% using the [CAS] criteria. . . ."

Dr. Goldman, on the other hand, believes that "Perry's echocardiogram shows no more than trace aortic regurgitation that may be backflow." At the hearing, Dr. Goldman was adamant that there was no aortic regurgitation.[12]

Q. I don't mean to belabor this one point, but the bottom line is, when you reviewed the DICOM tape and you signed your affidavit, you had no way of knowing whether those still frames existed in real time or not; correct?
A. When I signed the affidavit, that still frame -- I did not see the continuous loop of that particular still frame.
Q. Did that bother you?
A. No. There were other images on the tape or on the disk --
Q. Just so –
A. -- that confirmed that information.
Q. Just so I make sure I heard your testimony correctly, the only image in real time to visualize mitral regurgitation that you've presented in your direct testimony was from the parasternal long axis view, is that correct?
A. That was t he only answer we discussed this evening in the direct testimony, yes.
Q. I would really like a yes or no answer if you can do it.
When Mr. Sugarman was questioning you and showing you excerpts from tapes, the only real time loop that was played from the DICOM study in which you identified mitral regurgitation was from the parasternal long axis view; correct?
A. That's correct.
Q. And you're aware that under the settlement agreement, the parasternal long axis view was not an appropriate view to diagnose mitral regurgitation; correct?
A. I understand that that's not the preferred way to make the diagnosis, but that information is confirmatory.

[12] Q. Do you believe that any conclusion of FDA positive [aortic] regurgitation based on this tape would have been medically reasonable:

The Court notes that the Perry echocardiogram was of good technical quality with a high Nyquist limit of 76.9 cm/sec. It is disturbing that Dr. Goldman, who the Court found to be highly qualified, and the other physician experts here had such profound disagreements on this case. Dr. Millman, for example, testified:

> THE COURT: All right. Let's if we can turn to Ms. Ernestine Perry, did you have an opportunity to examine an echocardiography study on Ernestine Perry?
>
> THE WITNESS: Yes.
>
> THE COURT: Could you advise us whether it was conducted in a medically reasonable way and what information, if any, it provided you.

A. No, sir.
Q. Can you explain to the court why not?
A. Again, we may benefit by seeing in it real time, but I thought they included not turbulent flow in their tracings and the frame doesn't appear to be available in real time and the frame they used doesn't appear to represent other dynamic cycles that are available.
Let's play it in real time if we could start at the point four?

* * * *

Q. Goldman, again I'm going to ask you so plain (sic) to the court that we're seeing in this cardiac cycle?
A. This is a parasternal long axis view again. This is the aortic view flow area. This would be the area that you would expect to see the mitral regurgitation.
Q. The aortic regurgitation?
A. Again the aortic regurgitation thank you and I don't see any flow coming back into the Ralph flow back.
THE COURT: This is another high Nyquist.
A. The Nyquist again I think its appropriate seventy six point nine. The higher the better, and you like to have higher Nyquist the newer technology provides that.
Q. Did you see any aortic regurgitation there?
A. No no, sir. There's no jet regurgitation.
Q. Let's continue on.
A. We're looking to see if there's necessity sustained jet in the left ventricular outflow track.
Q. Do you see any?
A. No, sir. I certainly don't see severe.
Q. Do you see mild?
A. I don't see any. On P.P. I think they all show exactly the same.
Q. But there were some frames that were attached to the plaintiffs affidavit that purported to show jets were there not, Dr. Goldman.
A. I think there were.
Q. As were you watching the tape did you see anything like that on the tape in real time?
A. No. I didn't see those represented of frames anywhere on the tape.

> THE WITNESS: It was adequate and it did show that there was aortic regurgitation present more than 10 percent but less than 25 percent and the mitral regurgitant fraction was mild and less than 20 percent.
>
> THE COURT: Your essential conclusion with respect to Ms. Perry was that the study was adequately conducted, showed aortic regurgitation by FDA criteria in the settlement agreement but failed to show mitral regurgitation by the same criteria?
>
> THE WITNESS: That is correct.

Review of the opinions of the three (3) experts here convinces the Court that there is a reasonable medical difference of opinion as to whether Perry has MAR. Accordingly, the Court finds that Wyeth has failed to satisfy it that the conclusion that Perry had at least MAR was medically unreasonable.

I. Eleanor Smith

Smith relies on a June 7, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report of Dr. Jeffrey Crook. Dr. Crook found that Smith had severe aortic regurgitation using the CAS criteria -- JA/LVOT.

The June 7, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Millman and Dr. Charash. Both Dr. Goldman and Millman found that echocardiogram was not technically adequate. Dr. Millman found it to be "a poor quality study . . . [which] could in no way be used for adequate quantification of aortic . . . regurgitation." Like the Frost study the Nyquist limit was set at the inappropriate level of 46 cm/sec. and it did not vary with the depth of interrogation.

Dr. Charash, on the other hand, found the echocardiographic tape to be of diagnostic quality and found the finding of severe aortic regurgitation was justified.

> Q. All right. Did you have an opportunity to evaluate Ms. Smith's echocardiogram?
>
> A. I did.

> Q. Okay. And did you find it to be of diagnostic quality, doctor?
>
> A. Yes.
>
> Q. Did you reach any opinions within a reasonable degree of medical certainty regarding her levels of regurgitation?
>
> A. Yes.
>
> Q. Okay. What was your opinion, doctor?
>
> A. That she had at least FDA criteria, and again, I think it's more than 50 percent, certainly more than 10 percent.

The Court rejects this study and finds that it was performed in a medically unreasonable manner. The study is of poor quality and was done in disregard of appropriate echocardiographic standards. The Court accepts Dr. Millman's words in this regard since it cannot state its own conclusions with any better clarity.

> THE COURT: Let's turn to Miss Smith, Eleanor Smith. Were you asked to review an echocardiographic study of Ms. Smith?
>
> THE WITNESS: Yes, I was.
>
> THE COURT: And can you advise us what information you obtained from that study?
>
> THE WITNESS: Unfortunately, it was really poor and it was inadequate, really, to make any determination of aortic or mitral regurgitation. They were most likely mild but in a poor quality study that's tenuous at best.
>
> THE COURT: When you say tenuous at best, would it be medically reasonable in your opinion to have interpreted the echocardiographic study that you received as to either aortic and/or mitral regurgitation?

> THE WITNESS: It was really very poor, and although I think it is probably mild, if I were the person involved I would have another study done.
>
> * * * *
>
> THE COURT: What about from a classification standpoint for purposes of this legal matter, would it be medically reasonable to use this echo in any way?
>
> THE WITNESS: No, it would not, it should be repeated.

In sum, the Court finds that Wyeth has satisfied it that the Smith echocardiogram was performed in a medically unreasonably way. Any data generated by it is unreliable.

J. Patricia Stanford

Stanford relies on a June 7, 2002 echocardiogram performed by Cardiovascular Consulting, Inc. and a report by Dr. Jeffrey Crook. Dr. Crook found that Stanford had severe aortic regurgitation using the CAS criteria -- JH/LVOT. The report noted that the echocardiogram was "technically difficult."

The June 7, 2002 echocardiogram was reviewed by three (3) expert witnesses appearing in this proceeding: Dr. Goldman, Dr. Millman and Dr. Charash. Dr. Goldman found the echocardiogram to have been "acquired at an inappropriately low Nyquist limit (46 cm/sec), which can exaggerate the degree of regurgitation if present." Dr. Millman had concerns about the technical quality of the study, calling it "a relatively limited study," but concluded that it adequately demonstrates that Sanford has less than FDA Positive aortic regurgitation.

Dr. Charash, too, found that Stanford's echocardiogram was a poor study which he would not use to treat a patient. Nevertheless, he concluded the study was of sufficient quality to determine that Stanford had at least MAR.

> THE WITNESS: Stanford is the echo that had -- was the technically most difficult study of the seven that I reviewed. I know although it met the criteria, it was not at the level of resolution, and again, this is one of the

ones I believe that is using the four megahertz transducer and I think this is the downside of a four megahertz transducer; you can't see the image as well. I mean I think to a degree of medical -- I think I can make a statement as to what I think I see, but it is clearly the technically worst study of this group of seven.

MR. D'ANGELO: Let's -- we're going to play a short portion from 656 to 20 and we'll play it a few seconds.

BY MR. D'ANGELO:

Q. Tell us is the aortic jet visible in real-time doctor?

A. Yes. You see moments of regurgitation appear, but again, it's fading in and out of angle as much as you're seeing the heartbeat so you're losing.
Q. And that was through 656.42 that was played.

A. Yes.

Q. And why don't we go to --

THE COURT: Doctor, what's the quality of this workup?

THE WITNESS: It's a poor quality echo. Here is an example where the four megahertz transducer, pediatric transducer, this is the problem you get with it. The problem you get with a four megahertz transducer in an adult, and especially if it's a heavy adult, is that you just might see snowing in Buffalo for parts of your picture. You just won't see a quality picture. This is the reason why you don't prefer to use a smaller transducer.

Now there is information in here and the information you see although cloudy, isn't -- it won't create a mirage, it just won't let you see the mirage as well as you might see on other images.

So my opinion on this one is that more likely than not there's significant aortic regurgitation past the point of the FDA criteria.

THE COURT: Is this acceptable quality echocardiography?

THE WITNESS: And again, sir, it's not a yes/no answer.

In the clinical world, if this was being used to make medical decisions, no.

If this is being used in the purposes of court saying based on this as the sole piece of information, what is more likely than not occurring, I can make that statement.

I don't treat people on those same level that the law accepts in court. As an expert witness --

THE COURT: I think in a differential diagnosis you often do, doctor.

THE WITNESS: In some cases of course. I mean obviously it depends on the specific situation.

I would not tell a person in clinical practice that more likely than not you have aortic regurgitation if I can do a better quality image, but I can tell this court as an expert witness that more likely than not based on the frame we captured that there is more than mild aortic regurgitation, but I cannot, sir, tell you that I would ever treat somebody or say this is how I would go about in clinical medicine, but if we are health --

THE COURT: Just so we're all clear, this is not a good enough quality echocardiogram for you to treat a patient.

THE WITNESS: No, it is not. Well, it is enough for me to tell a patient to take antibiotics prophylactically

> because I believe there is enough damage to have the valve to justify it.
>
> It would not be enough for me to turn to a person to the degree since I know I have better tools and more I can use at my disposal, I would not turn to a person and say this is your definitive answer and here's where you stand.
>
> But again, that is different than as an expert witness in my role of telling you that I think more likely than not there's more than mild aortic regurgitation, but that's all I can tell you on this film.

The Court finds that the Stanford echocardiogram fails to satisfy the scientific minimums necessary to support a medically reasonable conclusion that Stanford had at least MAR. As already discussed in Frost, the Nyquist limits were set too low. Moreover, as Dr. Charash concedes the use of a pediatric transducer and the poor quality of the echocardiogram make it unacceptable in the clinical world.

For these reasons, the Court finds that Wyeth has satisfied it that the Stanford echocardiogram was performed in a medically unreasonably way. Any data generated by it is unreliable.

IV

For these reasons then, the Court grants Wyeth's motions to dismiss with prejudice as to Armstrong, Frost, Hill, Larman, Smith and Stanford and those plaintiffs will be returned to the Class. The Court, however, denies Wyeth's motions with respect to Bowles, Huffaker, Leavy and Perry. An Order reflecting these determinations was enclosed with this Letter Opinion.